

REMARKS

This application has been reviewed in light of the Office Action dated April 29, 2008. Claim 19 has been cancelled without prejudice and will not be discussed further. Claims 1, 3-10, 12-18 and 20 are presented for examination, of which Claims 1, 10 and 20 are in independent form and have been amended to define still more clearly what Applicant regards as his invention. Favorable reconsideration is respectfully requested.

In the outstanding Office Action, Claims 1, 19 and 20 were objected to on certain formal grounds, and Claim 19 was rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Cancellation of Claim 19 renders moot the corresponding objection and rejection. Claims 1 and 20 have been amended according to the Examiner's suggestions. Withdrawal of the corresponding objection is therefore respectfully requested.

Claims 1, 3, 4, 6-8, 10, 12, 13, 15-17 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,172,692 (Huang et al.) in view of U.S. Patent 6,822,757 (Usami et al.). In addition, Claims 5 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Huang* in view of *Usami* and further in view of U.S. Patent 6,058,207 (Tuijin et al.) and U.S. Patent 7,102,785 (Tamagawa), and Claims 9 and 18, as being unpatentable over *Huang* in view of *Usami* and further in view of U.S. Patent 6,577,826 (Misaizu et al.).

As discussed in the specification, the present invention provides an image processing method which determines, for printing an input image, a combination of usage amounts respectively of a plurality kinds of color material (such as CMYK) so that the total usage amount of the combination (y-axis) varies smoothly with an input signal value (as

opposed to hue, saturation, etc., x-axis). This prevents usage amounts from growing too rapidly for proper image densities and the likes to be realized.

Specifically, the aspects of the present invention to which the present claims are directed generate a nonlinear smooth function of how total usage amounts vary with input signal values, possibly in advance and one per color/hue (paragraph [0045], for example). Given an input signal, there are computed a list of combinations of usage amounts, each combination having a value close to the input signal value (paragraph [0043], for example). They then select from the list a combination of usage amounts that is on an appropriate smooth function with respect to the input signal (paragraph [0046], for example). In this way, the selected combination, which is to be outputted instead of the input signal, will have a value that is close to the input signal value (small variation in x-axis), while total usage amounts vary smoothly with input signal values overall.

Claim 1 recites, among other features, “determining a plurality of combinations of the plurality of kinds of color materials corresponding to the inputted image signal value; ... determining a nonlinear smooth variation of the total color material use amount with respect to a variation of the value of a predetermined color represented by image signals.”

The features recited above are not believed to be disclosed or taught in *Huang*. As Applicant understands, *Huang* relates to a method that determines a combination of usage amounts of diluted ink and saturated ink so that the value of the combination (y-axis) varies linearly with an input signal value (digital count, tone, etc., x-axis). Given an input signal, the method uses different types of ink in one of three ways – using diluted inks only, using both diluted and saturated inks, and using saturated inks only

– depending on the input signal value (*see* Fig. 7). Yet, the method invariably selects a combination of usage amounts only if it has a specific L^* value, which supposedly highly correlates with the value of the combination and is known to vary (inverse-)linearly with the input signal value (*see* Fig. 6). Applicant notes that for the specific input signal, the method never attempts to determine a list of combinations of usage amounts, each combination having a value close to the input signal value.

The portion of *Huang* cited in the Office Action as disclosing “determining a plurality of combinations of the plurality of kinds of color materials corresponding to the inputted input signal value” is part of the discussion of the procedure to build the linear smooth function of how L^* values of combination of usage amounts vary with input signal values. The statement that “many different combinations of diluted and saturated ink will meet this criteria” – having an L^* value that falls within a specific range – means only that each of such combination has an L^* value that is close to a predetermined value (which varies linearly with the input value signal) but not the input signal value itself – therefore no apparent variation in the x-axis (*see* Fig. 8).

In addition, the *Huang* method apparently generates only a linear smooth function, as it is reasonable to have an (inverse-)linear relationship between the L^* value of the combination of different kinds of printer ink and the input signal value. However, the method of the present invention automatically generates a non-linear function, by constructing a spline function, for example.

Usami does not remedy the deficiencies discussed above. Accordingly, Claim 1 is believed patentable over *Huang* and *Usami*, considered separately or in any

permissible combination (if any). Withdrawal of the Section 103 rejection is respectfully requested.

Independent Claims 10 and 20 are each either an apparatus or a computer-readable medium claim corresponding to method Claim 1, and are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or the other of independent Claims 1 and 10, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and allowance of the present application.

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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